

13.1 Reflection

Name: _____ Class: _____ Date: _____

Total: 8 marks

Objective

Build the skills to answer exam questions on **reflection**.

You must be able to:

- model light as a **ray** 光线 travelling in straight lines in a uniform medium
- state and apply the **law of reflection** 反射定律: the angle of incidence equals the angle of reflection
- distinguish **specular** 镜面反射 from **diffuse** 漫反射 reflection

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ The ray model

Light travels in **straight lines** in a uniform medium; a ray shows its path and direction.

■ Law of reflection

The **angle of incidence equals the angle of reflection**, both measured from the **normal** (the line perpendicular to the surface).

■ Specular vs diffuse

A smooth surface gives **specular** reflection (a clear image); a rough surface scatters light in all directions —**diffuse** reflection.

2 Practice

2.1 A ray strikes a mirror at 30° to the normal. State the angle of reflection. [1]

2.2 State the difference between specular and diffuse reflection. [2]

2.3 State the line from which the angle of incidence is measured. [1]

3 Exam-style questions

3.1 The law of reflection states that the angle of incidence equals the angle of [1]

- **A** refraction
 - **B** reflection
 - **C** incidence doubled
 - **D** 90°
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3.2 A rough wall reflects light mainly by [1]

- **A** specular reflection
 - **B** diffuse reflection
 - **C** refraction
 - **D** absorption only
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3.3 A ray strikes a plane mirror at 25° to the **mirror surface**.

(a) Find the angle of incidence (measured from the normal). [1]

(b) Find the angle of reflection. [1]

4 Go further

- work through the **13.1 Reflection** lesson on the **Learn** page;
- read the **Geometric Optics** section of the AP Physics 2 handout on the **Know** page.

Solutions

2.1 30° .

2.2 specular reflection is from a smooth surface and forms a clear image; diffuse reflection is from a rough surface and scatters the light.

2.3 the normal (the line perpendicular to the surface).

3.1 B.

3.2 B.

3.3 (a) $90^\circ - 25^\circ = 65^\circ$. (b) 65° .